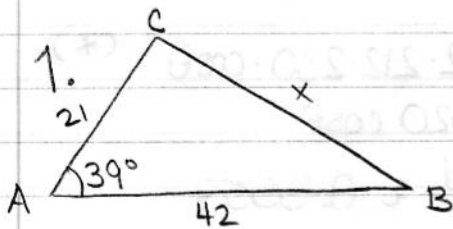


6.5 1, 3, 4, 27, 32, 36, 37



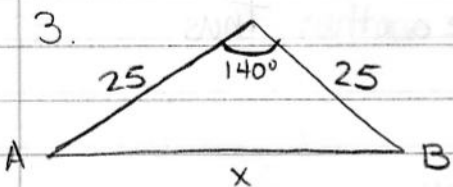
By Law of Cosines:

$$x^2 = 21^2 + 42^2 - 2 \cdot 21 \cdot 42 \cdot \cos 39^\circ$$

$$= 834.11$$

$$\text{so } x = \sqrt{834.11} = 28.9$$

(The back of the book has 28,9. The Europeans use a comma for a decimal point. I'm not sure how that slipped in here.)

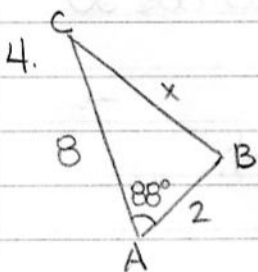


Law of Cosines:

$$x^2 = 25^2 + 25^2 - 2 \cdot 25 \cdot 25 \cdot \cos 140^\circ$$

$$= 2207.56$$

$$x = \sqrt{2207.56} = 47.0$$

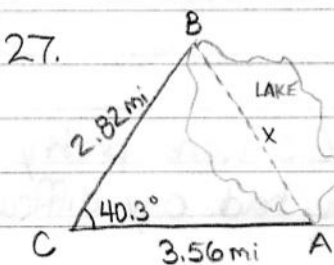


Law of Cosines:

$$x^2 = 8^2 + 2^2 - 2 \cdot 8 \cdot 2 \cdot \cos 88^\circ$$

$$= 66.88$$

$$x = \sqrt{66.88} = 8.18$$



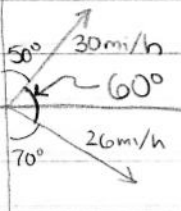
$$x^2 = 2.82^2 + 3.56^2 - 2 \cdot 2.82 \cdot 3.56 \cos 40.3^\circ$$

$$= 5.31$$

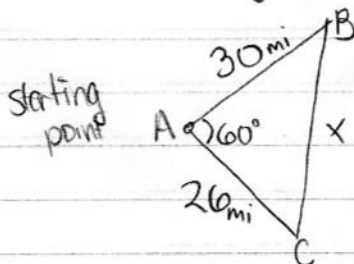
$$x = \sqrt{5.31} = 2.30$$

So the lake is 2.30 mi across.

32.



Boats leave the same point at speeds and directions shown. After one hour, we get the picture:



By Law of Cosines:

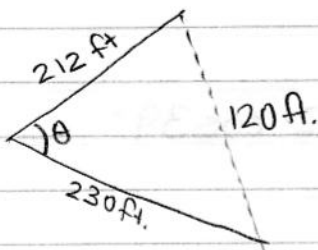
$$x^2 = 30^2 + 20^2 - 2 \cdot 30 \cdot 20 \cdot \cos 60^\circ$$

$$= 700$$

$$x = \sqrt{700} = 26.5 \text{ mi.}$$

So the boats are 26.5 mi apart.

36.



From Law of Cosines:

$$120^2 = 212^2 + 230^2 - 2 \cdot 212 \cdot 230 \cdot \cos \theta \quad (*)$$

$$14400 = 97844 - 97520 \cos \theta$$

$$\cos \theta = \frac{14400 - 97844}{-97520} \approx 0.8557$$

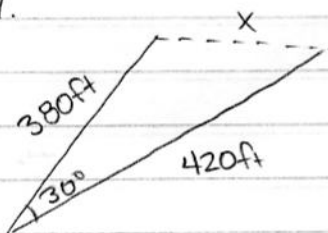
$$\text{so } \theta = \cos^{-1}(0.8557) = 31.2^\circ$$

(*) Why did I use 120 on the left? Because in the formula

$$a^2 = b^2 + c^2 - 2bc \cos A$$

side a and angle A have to be opposite one another. Thus $A = \theta$ and $a = 120$.

37.



From Law of Cosines:

$$x^2 = 380^2 + 420^2 - 2 \cdot 380 \cdot 420 \cdot \cos 30^\circ$$

$$= 44364.69$$

$$\text{so } x = \sqrt{44364.69} = 210.6$$

Thus the kites are 210.6 ft apart.

END OF 6.5

Recommendation: Since the assignments for 6.4 and 6.5 were pretty short, go back and do unassigned problems if you had any difficulty with the material.